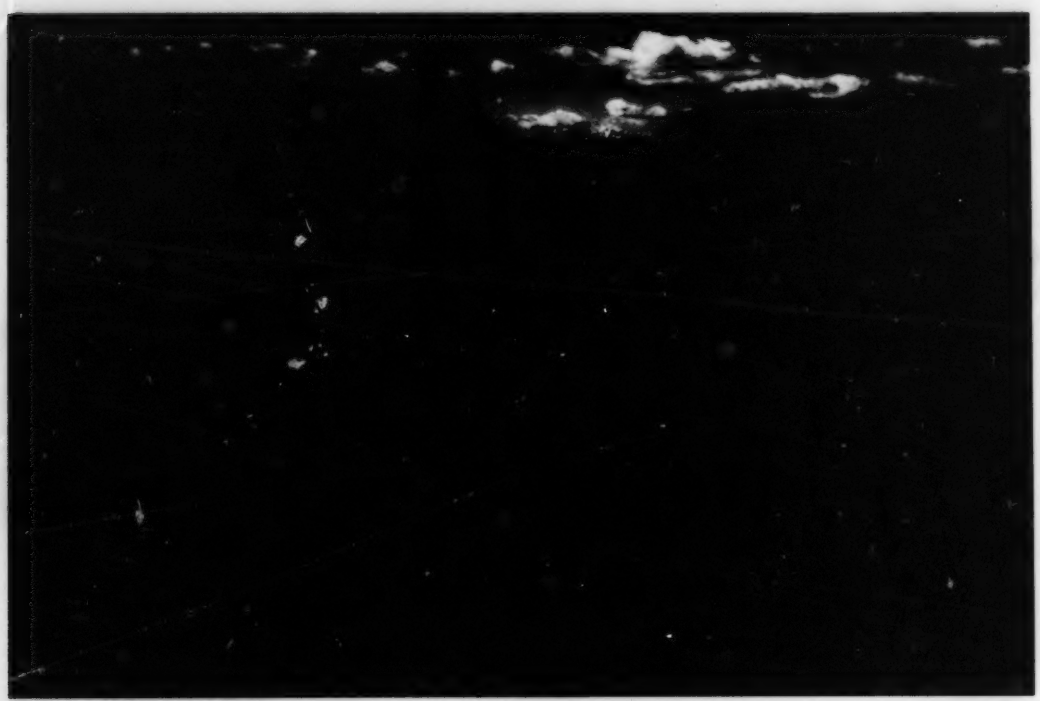
Protected Areas: Preserving Our Future

Decisions, Decisions

A Protected Areas' Case Study for the Chilcotin Plateau



T'syl-os Provincial Park

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An Environmental Education Guide to Protecting Natural Areas

Province of British Columbia
Ministry of Water, Land and Air Protection
Ministry of Forests

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Ministry of Water, Land and Air Protection
BC Parks

Ministry of Forests

Ministry of Sustainable Resource Management
Land Use Coordination Office

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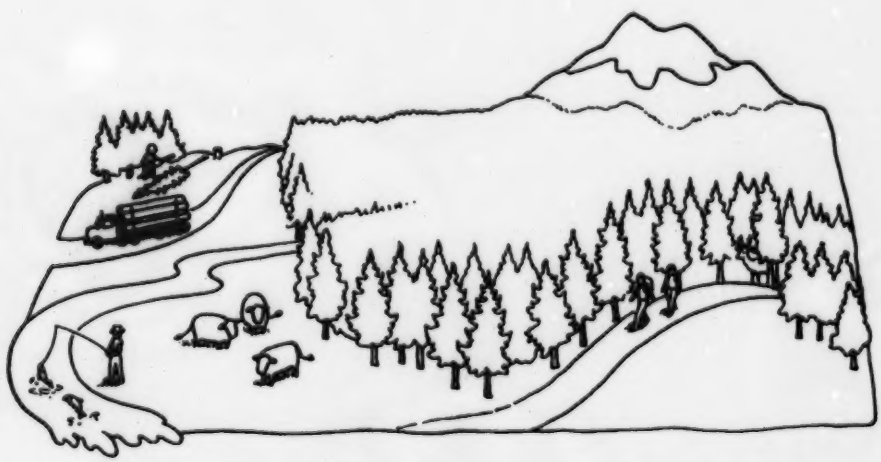
Decisions, Decisions: A Protected Areas' Case Study

Teacher's Notes

This case study provides a unique and detailed exploration of the protection process for one region in British Columbia as an example of what is taking place throughout the province and the country. In other areas, the interest groups and their members are different, but the process and challenges are very similar.

The main purpose of these activities is for students to experience the complexities involved in a process of protecting a natural area. Using economic, ecological and social information provided, and actual maps of part of the Chilcotin region of British Columbia, students will work in teams to examine the process for making the decision to protect a natural area, while considering the concerns of several groups in the region. A case study is a useful tool for students to get exposure to complex situations. By discussing environmental issues as a group, students can analyze issues, solve problems and become involved in decision-making. The activity promotes group work, and helps students organize their thoughts about complex issues instead of only voicing subjective personal preferences.



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The case study is developed through two activities.

In *Mapping For Decision*, students will work through the steps of creating a protected area by interpreting actual scientific data, considering the issue from several perspectives and manipulating maps and transparency overlays.

Collage of Voices closely involve students with different interest groups by stimulating values reflection.

These activities build authenticity for *The Public Hearing* which is an opportunity for students to debate real issues and make decisions.

In *What Really Happened*, students examine the decisions that were actually made in the Chilcotin Region, and compare these with their own predictions. A map is available online: *www.for.gov.bc.ca/cariboo/map.htm*

Materials required are listed for the individual activities. You will need to make classroom sets of the Case Study "Background Information" sheets (pp. 25–27) and Appendix 1—*Case Study Group Information Sheets*, as well as the maps and map transparencies.

NOTE: The issues, information and interest groups presented have been simplified for the purposes of the case study and are not meant to be comprehensive of the actual process.

Moose

Background Information— A Protected Areas' Case Study

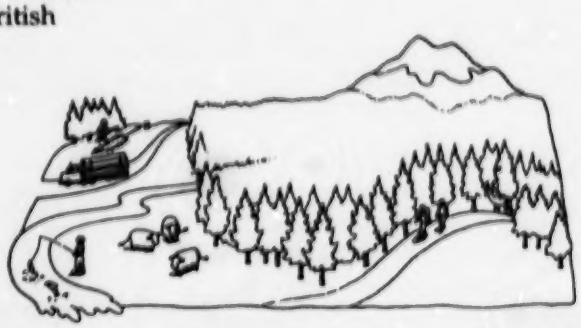
This case study is based on the real situation in the Chilcotin Plateau, a region in central British Columbia. The area is home to a great variety of plant and animal species and the landscape is varied.

Animals such as grizzly bears, California bighorn sheep, wolverines and mountain caribou roam the slopes of snowcapped mountains. The forested hills are home to large populations of mule deer, as well as the less common fisher and marten. Rare and sensitive plants add colour to the grasslands.

Large lakes nestle in some of the valleys; rivers wind their way through others. These bodies of water are home to more than 30 species of fish, including one of the largest populations of sockeye salmon in the province. Where drainage is poor, large expanses of wetlands have formed. Of provincial and national significance, these wetlands come to life every spring and fall with thousands of migrating birds. Many species of birds, including the American white pelican, raise their young here.

But the area is not untouched by humans. Several First Nations' groups have made their homes here for thousands of years. Archaeological sites give evidence of the lives they led—hunting, trapping, fishing and harvesting roots and berries.

The people living here today—both native and non-native—remain dependent on the area's natural resources. Most people work as loggers, miners, ranchers, and hunting, fishing or mountaineering guides. There are also teachers, nurses, storekeepers and other community service people. They make their homes in several small villages and towns, the largest being Williams Lake with a population of 11,000. About 1% of the people in British Columbia live here.



People living and visiting in the area enjoy a wide range of recreational activities. These include sport hunting and fishing, horseback riding, white and flat water paddling, roadside and wilderness camping, mountaineering, cross-country skiing, wildlife viewing and nature appreciation.

Like everywhere else in British Columbia, expansion is occurring. New roads are being paved, old roads are being widened. More and more forests are being logged, new mines

are being opened. Houses are being built, communities are growing. Meanwhile, habitat for plants and animals is shrinking.

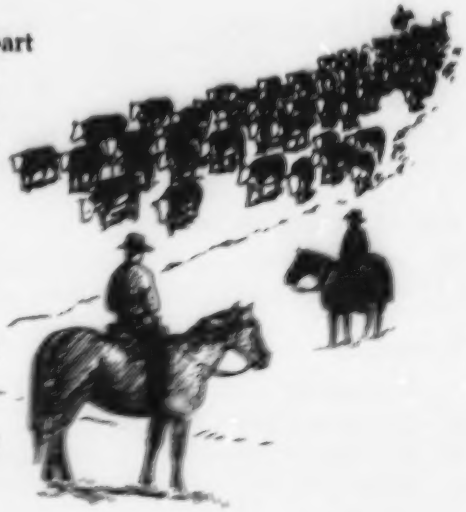
The provincial government made an announcement in 1992 that they wished to preserve 12% of British Columbia. They wanted to protect the wide variety of plants and animals that live in every region of the province, and to ensure that rare and endangered species and their habitats do not disappear. The government also wanted to protect cultural heritage and recreation features. There were few parks in the Chilcotin region—certainly nowhere near 12% of the land had been set aside. The federal government had also expressed interest in the area, looking at Churn Creek as a potential national park to represent the Interior Dry Plateau natural region.

Some people in the region felt threatened by these proposals. While they have enjoyed the area for its rugged wilderness, they knew that establishing protected areas may mean losing potential mining or logging sites, or it may mean less land is available for grazing cattle and sheep. It may mean hunting is banned in some areas. Jobs could be lost—there was a great deal of uncertainty. Most of these people wanted the high quality environment and the recreational opportunities they were accustomed to, but they also wanted to keep their jobs and standard of living. Other people in the region were thrilled by the announcement that more parks would be created.
A large group of mountaineers, naturalists and outdoors people had been lobbying the government for years to create a park in the spectacular Chilko Lake area. It is a magnificent wilderness area with undisturbed ecosystems, healthy wildlife populations and exceptional recreation opportunities.

The Nemiah people have claimed the area as an Aboriginal Wildlife Preserve. They consider themselves the principal right holders of the area which has spiritual significance for them. They wanted the government to legislate protection but also wanted control over how the park is regulated. They did not want to jeopardize their traditional lifestyles.

There has been limited mineral exploration in the area, but deposits of gold, silver, molybdenum and copper have been found, some of which appear to be very significant. Geological information indicates that there are excellent chances of other mineral discoveries there.

Ranchers have grazed their herds on the grasslands along part of Chilko Lake, but have not been allowed to expand since the late 1960s. A little more than 50% of the area is forested with good timber; to date little has been cut. Trappers have been making their living here for years, selling lynx, fisher, marten and beaver furs.



Twenty tourist lodges and campsites operate in the area, mainly serving people interested in the excellent wilderness lake and stream fishing. There has also been some big game hunting of grizzly and black bears, bighorn sheep, mountain goats and mule deer. Guiding for horseback riders and hikers has been on the rise. Water sports such as canoeing, kayaking, windsurfing and power boating are other lures for tourists as are nature study, photography and wildlife viewing.

But even the conservationists did not all agree about making Chilko Lake into a park—some thought other areas in the region were more important to protect. The wetlands, grasslands and forested hills are vital to so many plants and animals. There also was concern about the spider's web of logging and mining roads, and about maintaining views along other roads.

The issue is complicated. People from the Chilcotin area worked to find a way to protect their livelihoods and homes, as well as some of the natural world around them. You have an opportunity to stand in the shoes of the different groups and learn about, discuss and debate their important concerns.

Mule Deer

1. Silhouettes

Key Concepts

People and societies differ in what they value, but all value things for their perceived significant characteristics.

Activity Description

Students create imaginary dialogue to discover the variety of people within a single group and explore stereotypes.

Materials

- *Appendix 1—Case Study Group Information Sheets*
- a roll of newsprint
- scissors
- felt pens

Time

1 period

Let's Begin!

1. Divide students into working groups and assign or have each group select one of the Chilcotin groups.

   Have them read the relevant data sheets (see Appendix 1 —*Case Study Group Information Sheets*).

2. Give each group a large piece of newsprint and felt pens. Ask them to draw 4-6 simple silhouettes. These represent the people they imagine might be in their group, and should be labeled. For example, in the First Nations group, the silhouettes might represent an elder, a logger, a fisher, an artist, a teenage girl, etc.

3. Inside each silhouette, have students write some of the key views that individual might have about the protected area issues.

   Remind students that not everyone in the group will have the same opinions or reasons. For example, in the tourism group, a lodge operator might say, "It's fine by me that a protected area be established northwest of Williams Lake, but licensed hunting has got to be allowed." However, an ecotour group member might say, "We need a vast increase in our protected areas and all hunting should be banned in these areas."

4. Gather the class together and have each group read some of their dialogue. Discuss whether it was difficult to find several points of view for the groups and why or why not. If students have had a tendency to stereotype their characters, talk about it and then ask how they might write their dialogue differently.

Journalling

How has this exercise made it more or less difficult to decide which group you can understand or relate to?

Extension

Other Voices

1. Instead of humans, have students **select and research** other animal and plant species that live in the region. (See the *Biological Conservation Interests* in Appendix 1 for ideas, or find information in the brochures from the Ministry of Water, Land and Air Protection.)
2. Groups could then **draw** silhouettes of their chosen animal or plant, and express their needs and visions for the region. See *Thinking Like a Mountain: Towards a Council of All Beings*, for more information and ideas. (Seed, J., & J. Macy. 1988. Gabriola Island, BC: New Society Publishers.)

Golden-crowned Kinglet

(cont'd)

2. Collage of Voices

Key Concepts

- Humans protect material and non-material things that have meaning to ourselves, our heritage and culture and that reflect our values and needs.
- People and societies differ in what they value, but all value things for their perceived significant characteristics.

Activity Description

Students write a newspaper article in character to deepen their understanding of the values involved in protected areas decisions.

Materials

- Appendix 1—*Case Study Group Information Sheets*
- Case Study "Background Information" sheets (pp. 25–27)
- pens and paper

Time

1 period

Let's Begin!

1. Have students select a public or private group (other than the one they have worked with already). Have them sit in their own space, ask them to close their eyes and imagine that they have become a member of that group. The following questions and some of your own may help students visualize their character. Give students time to think and reflect as you ask these questions:
   - What does your character believe in?
   - What are you deeply enthusiastic about?
   - How do you talk?
   - What is your name, occupation, lifestyle?
2. While students' eyes remain closed, tell them they are about to write a letter to the newspaper "in character." They will be writing in response to the news they have just heard, that a proposed protected area near their community will be developed. Logging and mining will not be allowed. The area is known for its dense cedar and hemlock forests, two large rivers and a lake. The water systems are excellent fish habitat and attract many tourists to local fishing lodges. Their letter

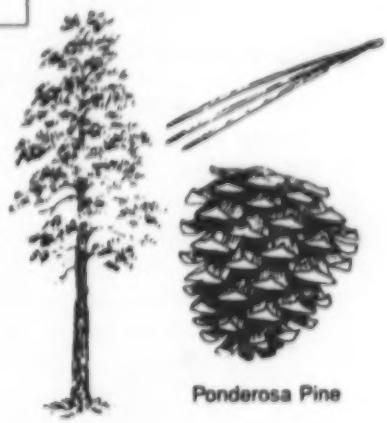
should be no more than two paragraphs.

3. Allow 15 minutes for letter writing.
4. Ask students to read their own letters and circle the one most important sentence in their letter.
5. Have students gather in a circle. Going around the circle, ask them to read their sentences out, one line at a time. Without commentary between readings, the session will be a dramatic voice collage depicting the difficult task of choosing protected areas in our diverse culture.
6. After the circle, have students share in pairs what they heard and how it made them feel.

Extension

Other Voices

1. Instead of humans, have students **select** and **research** other animal and plant species that live in the region. (See *Biological Conservation Interests* information, Appendix 1, or Ministry of Water, Land and Air Protection pamphlets for ideas.)
2. Groups could then **speak** for their chosen animal or plant, and express their needs and visions for the region. (For more information and ideas, see *Thinking Like a Mountain: Towards a Council of All Beings*, Seed, J. & J. Macy. 1988. Gabriola Island, BC: New Society Publishers.



Ponderosa Pine

(cont'd)

3. Mapping For Decision

Key Concepts

- Part of the process of protecting habitat in British Columbia involves identifying areas according to their climate, geology, plant and animal life, and having an understanding of ecology and island biogeography.
- There are costs and benefits associated with protection.
- Protection is an ongoing and complicated process involving input from all those involved, but protection of natural areas should give significant consideration to environmental concerns.

Activity Description

Students study information and manipulate maps to see a visual representation of ecosystems and make informed decisions concerning land use in an area of central B.C.

Materials

- copies of the maps (Appendix 2) as described below—enough so that each group of students has one set
- class copies of the Biogeoclimatic Zone Information sheet (Appendix 3)
- class copies of Student Workbook (pp. 17–25)

Preparing Group Map Sets:

Map number and title	What to do with it
#1. Chilcotin Case Study Region	• photocopy
#2. Community Map	• transparency copy
#3. Biogeoclimatic Zone blackline map (1)	• photocopy & have student colour blackline
#4. Mule Deer Ranges	• transparency copy
#5. Endangered Species	• transparency copy
#6. Grasslands Areas	• transparency copy
#7. Old-growth Forest Areas	• transparency copy
#8. Conservation Proposals	• transparency copy

Each group's map set will consist of 6 transparencies and 2 photocopied maps, one black and white, and one colour.

NOTE: Map #9 represents the protected areas of the Cariboo-Chilcotin region. This map is used in Activity 4-7: *What Really Happened*, and could also be examined as an extension to this activity.

Time

1 period

Connections

Backyard Biodiversity and Beyond

- Module 4: Endangered Species/Endangered Spaces
- The B.C. Red and Blue Lists of endangered and threatened species (Appendix 4)

Teacher's Note

In this activity, students will be working in small groups to analyze a series of maps. By following the in-depth instructions on their worksheets, it will be possible for them to make detailed interpretations of the data. A black and white copy of the Biogeoclimatic Zone Map has been included, which students can colour using the letters as a guide.

If you have done *Plants and Animals of Protected Areas*, (Activity 3-2 in *Protected Areas: Preserving Our Future*), your students will be familiar with the biogeoclimatic zone system. If not, you may wish to refer to the background notes for that activity (see Appendix 3 and 4—*British Columbia's Biogeoclimatic Zones* and *British Columbia's Ecoprovinces*). Although not mandatory, having students read the Case Study "Background Information" (pp. 25–27 of this Section) and the group data sheets (Appendix 1—*Case Study Group Information Sheets*) will enrich the activity.

Background

"GAP analysis" is a termed coined by geographers and biologists who use maps to determine where there are "gaps" in regions that need protection. Information about almost any characteristic or use of an area is fed into a computer to generate a visual image, or map, of that data. By laying one map over another, interesting patterns emerge which help determine where protected areas should be located. This technique is extremely valuable in land-use decisions since many interests (and a lot of data) can be considered.

In this exercise, potential locations for protected areas are identified as students manipulate the maps. Areas where there are conflicts of interest also become apparent.

Raven

Let's Begin!

1. Divide your class into groups of 4 - 6.

   Each group should have a well lit, flat surface to work on, with a sheet of white paper over which to place the maps.

   Students may also wish to clip the maps together and hold them up to the light for easier viewing.

2. Look at the map of British Columbia (#1). It outlines the portion of the Chilcotin region where our case study and mapping exercise take place.

   As a class, discuss what you know about the region.
   - How many class members have been there?
   - What does the landscape look like?
   - What is the climate like?
   - What animals and plants live there?
   - Do many people live in the area?

3. Distribute the background information sheets, mapping workbooks and the maps.

   Have students work through the steps in the workbooks in their groups to come up with proposed protected areas. Then have groups present their findings to the class.

   Discuss difficulties students had in making decisions, and similarities and differences in the areas they proposed to protect.

Lupine

4. What Really Happened

Key Concepts

- Humans protect material and non-material things that have meaning to ourselves, our heritage and culture and that reflect our values and needs.
- Protection is an ongoing and complicated process involving input from all those involved, but protection of natural areas should give significant consideration to environmental concerns.

Activity Description

Students review a protected area decision so they can reflect on the difficult process of deciding on protected areas and their costs and benefits.

Materials

All maps from Appendix 2

NOTE: More detail recreation maps of the Cariboo Forest District can be found at: *www.for.gov.bc.cariboo/map.htm*

Time

1 period

Let's Begin!

Show students map #9, the protected areas of the Cariboo-Chilcotin region. Additional information has been included, showing the new parks established in 1995. Inform students that the Chilko Lake region has been made into *Ts'yl-os Provincial Park*. It was selected for its spectacular beauty, recreational opportunities and special spiritual and cultural importance for native people. It includes habitat for animals such as grizzly bear and California bighorn sheep. The park is named for Ts'yl-os, a significant person in the Nemiah First Nation's oral history, whose name means "one who protects and watches over it."

Point out other areas that have been protected.

Considering students' map work, and the decisions made in the class public hearing, discuss (in small groups or as a class) whether Chilko Lake is the best location for a park.

Mule Deer

The following questions may help deepen the discussion:

1. Is this area representative of the region's ecosystems and biodiversity? (Refer to the Biogeoclimatic Zone map—coloured map #3. Is it representative of the range of colour zones in the region?)
2. Does the area protect any of the following? (refer to the maps)
   - freshwater ecosystems (rivers and lakes)
   - rare and endangered species and their critical habitats, such as old-growth forest, grassland or wetland habitat
   - a variety of land forms: mountains, valleys, wetlands and grasslands
   - outstanding recreational features
3. Wherever possible, protected areas should combine natural, cultural heritage and recreational values. Does the park do this?
4. Is this where you would have chosen a park? Why or why not?
5. What are some of the costs associated with choosing this area? How will the park affect people's lives? Were there other areas in the region that you feel should have been protected?

Moose

NAME _____

DATE _____

Student Workbook

Mapping for Decision

Mapping for Decision

This activity allows you to become protected areas' decision-makers! By using the maps and information about the Chilcotin region, you will choose areas you believe should be protected.

Make sure you have one copy of the coloured biogeoclimatic map and 6 transparency maps.

Follow these directions to guide you in using the maps.

STEP 1

Place the community map #2 on your desk.

- Notice which towns you have visited or heard of.
- Use the key to distinguish roads from rivers.
- Locate north, south, east and west.
- Where are most of the towns and roads located?

_____

_____

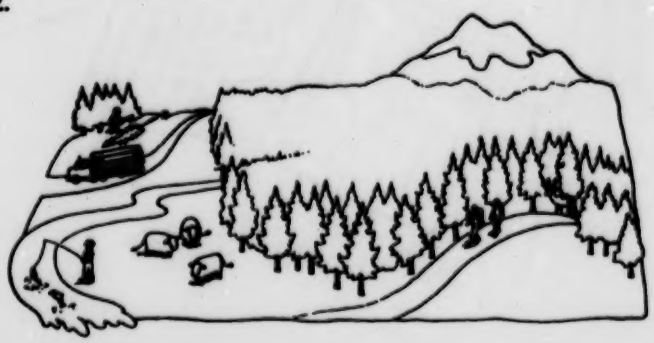
Why do you think they are here?

_____

_____

_____

Remove map #2.



STEP 2

Place the Biogeoclimatic Zone Coloured Map #3 on your desk.

Each colour on this map represents a different biogeoclimatic zone. A biogeoclimatic zone is a unit of land that is distinguished by its climate, vegetation and type of soil. Certain kinds of plants and animals tend to live in each biogeoclimatic zone and some plants and animals are found in two or more of the zones.

- Using the map and the information sheet on biogeoclimatic zones, describe the kind of plants and animals found in these areas:

  a) the eastern portion of the map (Interior Douglas-fir Zone)

  _____

  _____

  b) the southwest (Alpine Tundra and Bunchgrass Zones)

  _____

  _____

  c) the northwest (Sub-Boreal Pine-Spruce Zone & Montane Spruce Zone)

  _____

  _____

- Still using the map and the information sheet on biogeoclimatic zones, determine which areas in the region would likely be used most for:

  a) logging _____

  b) cattle ranching _____

  c) growing vegetables _____

  d) mountain climbing _____

- Discuss how protecting different biogeoclimatic zones might help preserve biodiversity (a wide variety of plants and animals).

STEP 3

Keeping map #3 on your desk, place the transparency community map #2 on top of it. (Take care to match the outline of the region on the two maps.)

- What kind of forest is most common where the major towns are located?

  _____

- Why do you think the towns are located here?

  _____

  _____

- Which plants and animals do you think are most affected by the location of the towns?

  _____

  _____

  Why? _____

  _____

STEP 4

Place the mule deer range map #4 over maps #2 and #3.

- In which biogeoclimatic zone is most of the mule deer range?

  _____

- What kinds of human activities take place and what kind of human constructions are found in the mule deer range?

  _____

  _____

- If people expand their activities, what might happen to the mule deer?

  _____

  _____

Remove map #4 only.

STEP 5

Place the endangered species map #5 over maps #2 and #3.

Red and Blue lists refer to levels of threat to those species: the Red List includes species considered endangered or threatened now, while the Blue List includes vulnerable species that could become eligible for the Red List in the future.

- In which biogeoclimatic zones do most of the endangered species live?

_____

_____

- Do the maps show a relationship between endangered species and the location of human activities and developments?

_____

- Describe what is taking place.

_____

_____

When there is an endangered species, it usually means its habitat is also disappearing. These areas are called "endangered spaces."

- Which biogeoclimatic zones are becoming endangered in the region?

_____

_____

- How might that be changed?

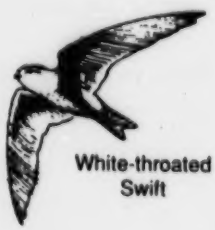
_____

_____

_____

_____

_____



White-throated Swift

STEP 6

Remove map #2.

Place the grasslands areas map #6 over maps #3 and #5.

- In which biogeoclimatic zone(s) are the grasslands located?

_____

_____

- What do the maps tell you about the grasslands?

_____

_____

- What do you think humans use the grasslands for?

_____

_____

- How does this affect the rare and sensitive plants and animals that live there?

_____

_____

_____

- What should be done?

_____

_____

_____

Remove all the maps.

STEP 7

Place old-growth forest areas map #7 on your desk.

- How much old-growth is left in the region?

_____

Place map #7 over map #3.

- What biogeoclimatic zones are the old-growth forests found in?

_____

_____

Now remove map #3 and place map #7 over the community map #2.

Notice where the roads and towns are, and compare this to where the old-growth forests are left.

Old-growth forests are very important for biodiversity, as they provide habitat for many rare species of plants and animals that do not occur anywhere else.

- Knowing this, and keeping in mind the dependency of the region on the forest industry, where do you think protected areas should be located?

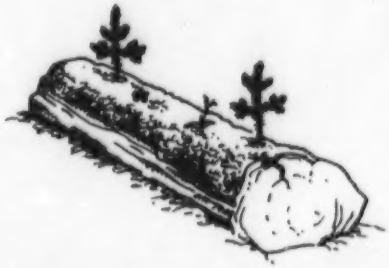
_____

_____

_____

_____

Remove all the maps.



STEP 8

Place the conservation proposal map #8 on your desk.

- Notice the areas various mountaineering, naturalist and environmental groups proposed for protection ("proposed protected").
- Notice where they suggested human use should be limited ("low intensity areas").

NOTE: The large dark area on this conservation proposal map was proposed as a park in the late 1970s (other dark areas show existing parks). During the case study, you will determine whether it should be protected or whether other areas should be considered first.

STEP 9

Place the biogeoclimatic zone map #3 under map #8.

- What biogeoclimatic zones are in the proposed park areas? (shaded areas)

  _____

  _____

- What wildlife is found in these zones?

  _____

  _____

- Which industries and people might be interested in the area?

  _____

  _____

  _____

  Why? _____

  _____

  _____

STEP 10

Place the endangered species map #5 over maps #3 and #8.

- Will endangered species and their habitats be protected in the park areas? (yes or no) _____

  In the low intensity use areas? (yes or no) _____

- Do you think this protection is adequate? (yes or no) _____

STEP 11

Use whichever maps will help you.

- Discuss the problem of competition for habitat that takes place between humans and animals.
- Thinking about all the maps you have looked at, where would you locate protected areas?

_____

_____

_____

_____

_____

_____

Black Bear

Appendix 1—Case Study Public & Private Group Information Sheets

Agriculture Interests

Cattle ranching makes up most of the agriculture, and is one of the oldest industries in the area. Located throughout the region, many ranches are family owned and operated. Some were started more than 100 years ago.

Ranchers today are facing difficulties getting access to enough land and water. Their cattle graze mainly on natural grasses and plants growing on leased crown land.

Ranchers need access to rivers and wetlands to water their crops and animals. They would like to expand their operations but are concerned about protected areas limiting the availability of the grasslands, wetlands and river areas.

Other agriculture includes sheep farming, and some vegetable and grain crops. The best soil in the region is found in the southern river valleys, and where wetlands have been drained.

Tourism Interests

The tourism industry is a family industry that has been operating for more than 40 years. It includes guides and outfitters for hunting and wilderness adventures, sports fishing operations, and many guest lodges. Recently the industry has grown to include tourists from around the world.

The area in general benefits from tourism, with many visitors travelling and staying in the region to enjoy the varied recreation opportunities (see background information for more details).

The impact of logging and road building for logging and mining sites is a concern for the industry. Members of the tourism industry want to ensure that the area remains attractive to a wide range of visitors. They would like some certainty that their industry can continue to expand.

First Nations' Interests

While many First Nations' people work in the logging and ranching industries, many also depend on hunting, trapping and fishing as well as berry and medicinal plant gathering. They are interested that these resources be protected, and they have deeper concerns.

The local Tribal council has stated that "the land is the basis of all our being, so its uses have to reflect and support all our needs: social, cultural, psychological, physical and spiritual, as well as economic"

They believe that all uses of the land must be protected, including heritage, cultural sites and activities, and they have concerns that protected areas might limit their traditional activities.

Mule deer, moose, salmon and trout make up a significant portion of the people's diet. Fisher, marten, lynx, beaver and muskrat are all important to the trappers. Some of the people keep livestock and depend on continued access to grasslands.

The First Nations' groups want to participate fully in all land-use decisions in the region, including the management of protected areas.

Forestry Interests

A wide variety of forests cover more than half the Chilcotin area. Douglas-fir, lodgepole pine and spruce are important timber species. Family businesses and large companies have harvested timber here for many years, providing a large percentage of the jobs in the region. These include logging, silviculture, tree planting, environmental restoration projects and wood manufacturing. The industry is doing well at present, and is globally competitive, yet natural timber supplies are shrinking and second-growth forests are not yet ready for harvesting.

Mechanization in the forest industry has played a large role in the decrease of forest jobs. Forestry companies want to make sure they have a secure forest land base to protect jobs and the local economy. They are willing to co-exist with other users of the forest. They worry that an increase in protected areas will further reduce their timber supplies.

Biological Conservation Interests

The region is ecologically rich, with lots of different kinds of species and habitats. Interests include protecting critical fish and wildlife habitats and the natural richness of the region. Concerns include road construction, wetland drainage, grazing, and logging. Most of the endangered species, such as grizzly, fisher and some bat species, are in the Fraser River Basin, where the most sensitive habitat also lies. Another concern is the fact that many species, including mule deer and mountain caribou, are dependent on a combination of new and old-growth forests.

Special wildlife features of the area include:

- the only nesting colony of American white pelicans in the province
- a large number of wetlands which support many species including moose, fisher, waterfowl, and pelicans
- important populations of mountain caribou and mule deer
- the largest and most northerly California bighorn sheep population in North America
- the third largest sockeye salmon population in British Columbia

Moose

Mining Interests

Mining has been an important industry in the region for more than a century. Mining companies employ many people and are of economic benefit to the region. The industry ranges from individual and family operations to small companies and major corporations. Mineral resources include provincially significant placer gold, hard rock and industrial minerals. Several proposed mines either have approval or are nearing approval, while rising metal prices could trigger the reopening of mines that are currently shut down.

The industry wants access to as much land as possible for exploration and development. They are worried about protected areas reducing their access to lands in the region. They are willing to co-exist with other land users, and feel they can, due to the environmental laws and regulations they must meet in their exploration and mining practices. They also want to be paid back for mineral rights lost through the creation of new protected areas.

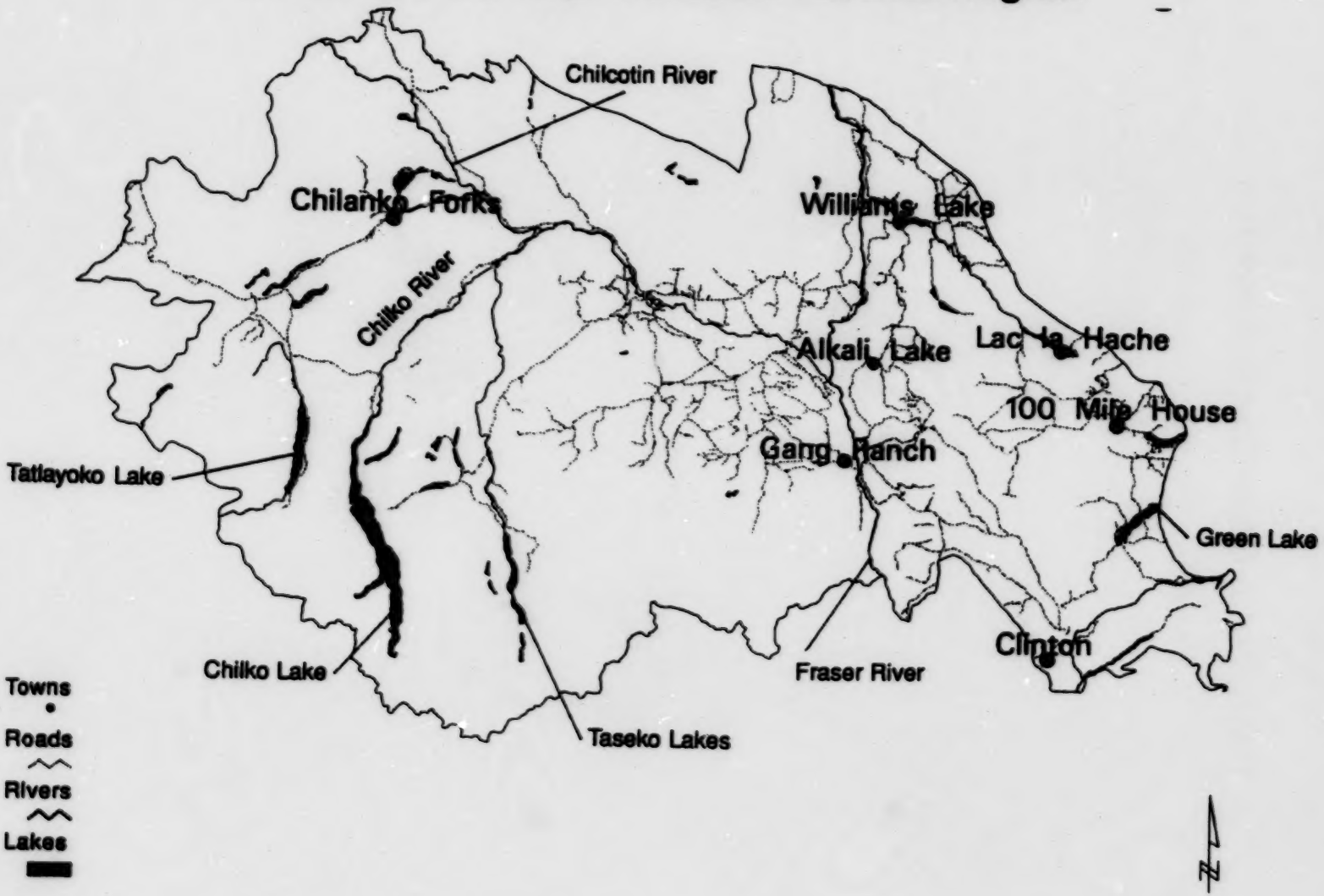
Appendix 2—Case Study Map Masters

Preparing Group Map Sets for *Mapping for Decision* activity (Section 4)

Map number and title	What to do with it
#1. Chilcotin Case Study Region	• photocopy
#2. Community Map	• transparency copy
#3. Biogeoclimatic Zone blackline map (1)	• photocopy & have student colour blackline
#4. Mule Deer Ranges	• transparency copy
#5. Endangered Species	• transparency copy
#6. Grasslands Areas	• transparency copy
#7. Old-growth Forest Areas	• transparency copy
#8. Conservation Proposals	• transparency copy
#9. Protected Areas (for the Cariboo-Chilcotin region) This map is used in Activity 4: *What Really Happened* and could also be examined as an extension to Activity 3: *Mapping for Decision.*	

1. Chilcotin Case Study Region

2. Community Map: Southern Cariboo Region



3. Biogeoclimatic Zones

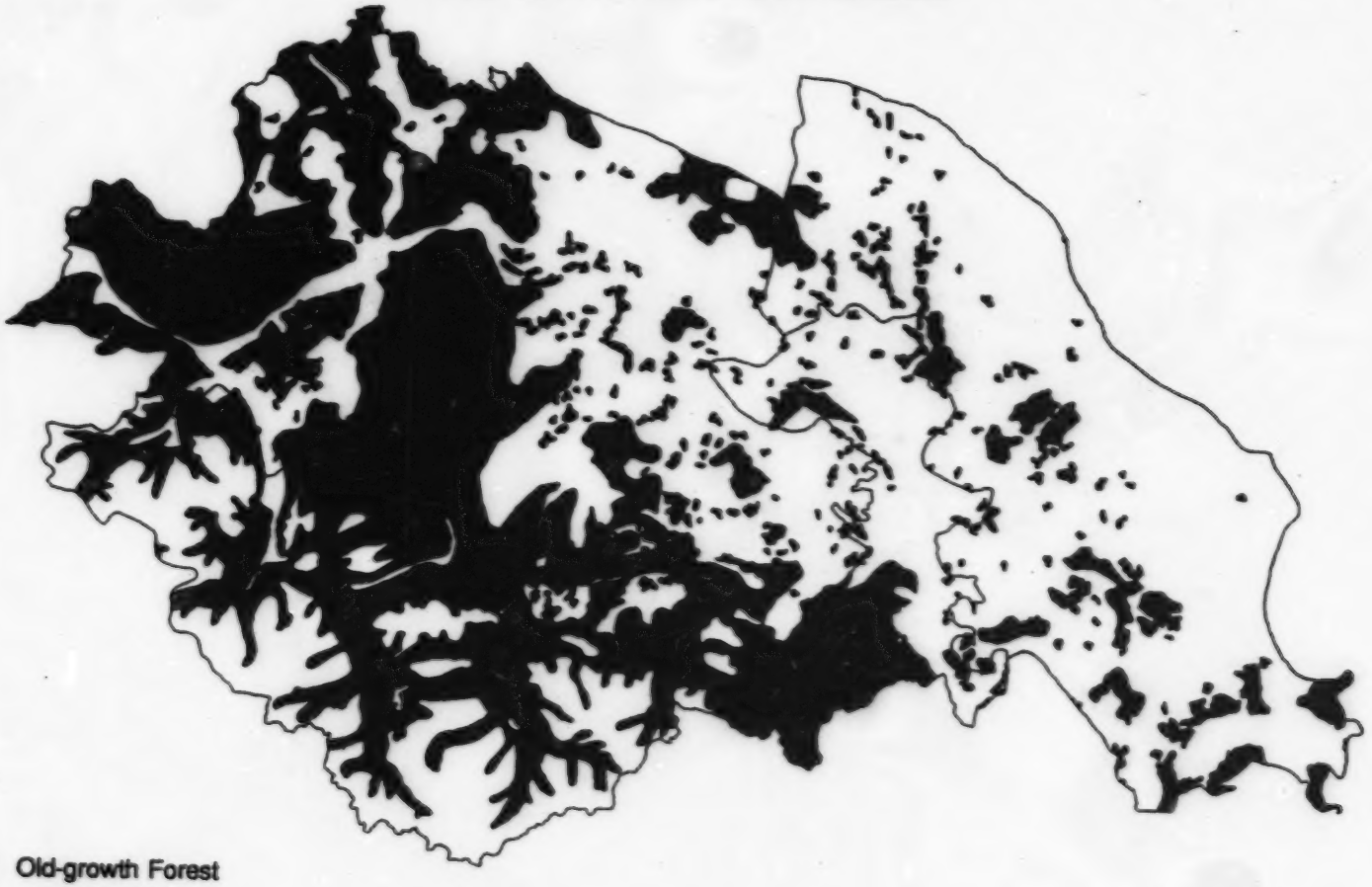
- A Alpine Tundra Zone
- B Bunchgrass Zone
- C Coastal Western Hemlock Zone
- E Engelmann Spruce - Subalpine Fir Zone
- I Interior Douglas-fir Zone
- M Montane Spruce Zone
- S Sub-boreal Pine and Spruce Zone

4. Mule Deer Ranges

5. Endangered Species

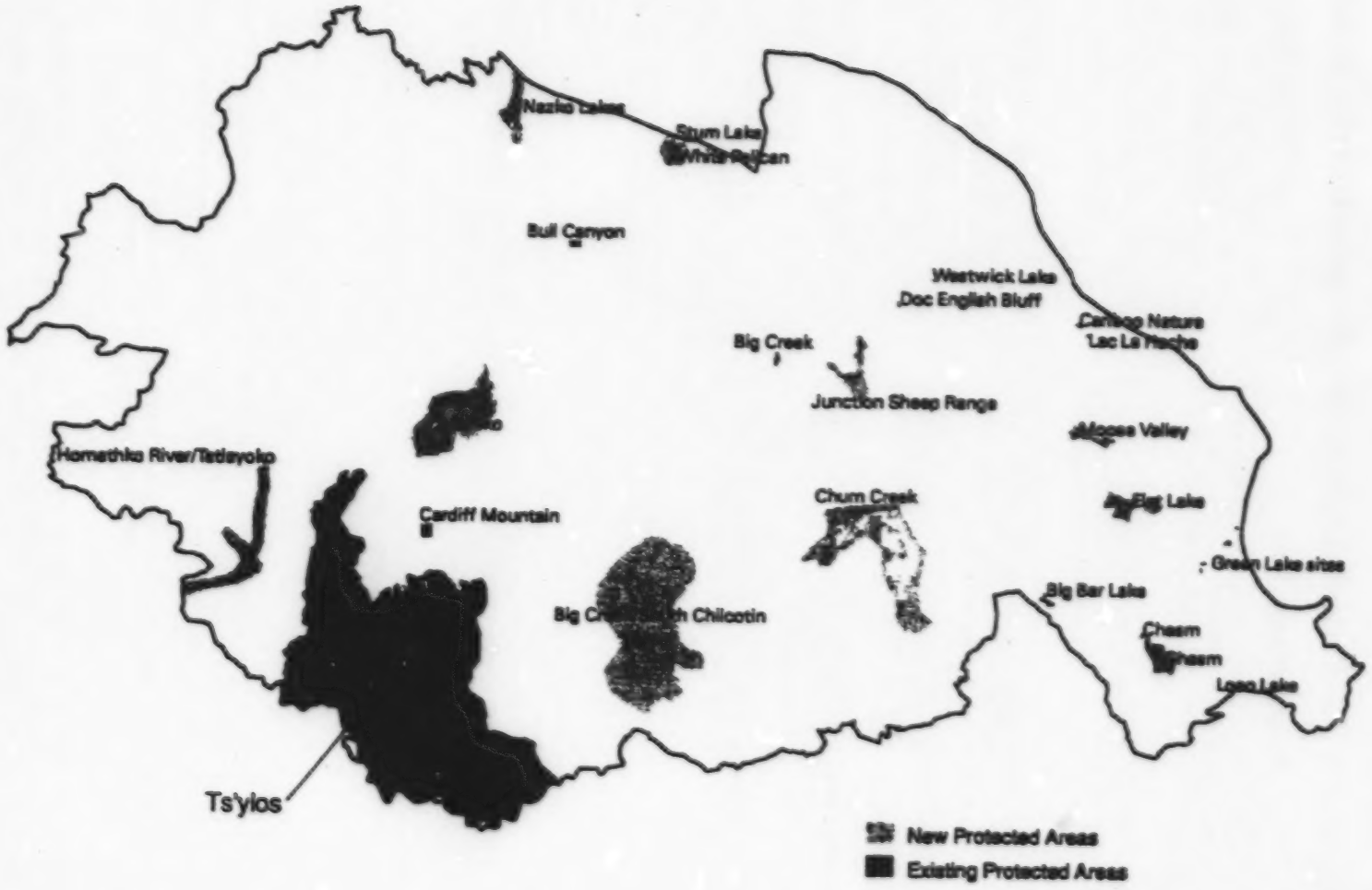
6. Grasslands Areas

7. Old-growth Forest Areas



8. Conservation Proposals

9. Protected Areas



Appendix 3—British Columbia's Biogeoclimatic Zones*

Biogeoclimatic Zone	Some Plants & Animals
Coastal Douglas-fir Zone is limited to a small part of Vancouver Island, several islands in the Gulf of Georgia and a narrow strip of the mainland with warm, dry summers and mild, wet winters.	• Brandt's cormorant, Anna's hummingbird, Western red-backed salamander, Townsend's big-eared bat • red honeysuckle, Indian-plum, Douglas-fir, arbutus, Garry oak
Coastal Western Hemlock Zone covers much of Vancouver Island and the coast to the Queen Charlotte Islands, and is the rainiest zone in B.C. with cool summers and mild wet winters.	• black-tailed deer, northern sea lion, Pacific tree frog, osprey • Indian pipe, western hemlock, western redcedar, twinflower
Mountain Hemlock Zone occurs all along the coast in B.C. at higher elevations than the previous zone, and features steep terrain, and heavy snow fall in the winter.	• common raven, Vancouver Island marmot, cougar, snowshoe hare • yellow-cedar, mountain hemlock, amabilis fir
Bunchgrass Zone makes up the grasslands found in the major southern valleys of the province, featuring hot dry summers and cool winters with little snowfall.	• coyote, Rocky Mountain elk, western meadowlark, western yellow-bellied racer • sagebrush, bluebunch wheatgrass, prickly-pear cactus
Ponderosa Pine Zone is the driest zone in B.C., occurring along the very dry valleys in the interior, with very hot dry summers, and cool winters with little snow.	• badger, little brown myotis, black-billed magpie, western rattlesnake • prickly-pear cactus, yellow bell, ponderosa pine
Interior Douglas-fir Zone is found at middle elevations in the interior of B.C., with long warm and dry summers, and cool winters.	• black bear, white-tailed deer, northern pygmy-owl, northern pocket gopher • balsam-root, Douglas-fir, lodgepole pine
Interior Cedar-Hemlock Zone occurs in southeastern B.C., with cool wet winters and warm dry summers, and has the highest number of trees of any zone.	• downy woodpecker, golden eagle, moose, wolverine • wild ginger, western redcedar, western hemlock, grand fir
Montane Spruce Zone occurs in middle elevations in the interior, with cold snowy winters and short warm summers.	• caribou, three-toed woodpecker, fisher, porcupine • black huckleberry, bunchberry, lodgepole pine
Sub-Boreal Pine-Spruce Zone occurs on the high plateau in the west central interior of B.C., mostly within the Chilcotin, having cold dry winters and cool dry summers.	• sandhill crane, trumpeter swan, red fox, wood frog, grizzly bear • sundew, white spruce, kinnikinnick
Sub-Boreal Spruce Zone is the mountainous area of B.C.'s central interior, with severe snowy winters, and warm short summers.	• deer mouse, gray wolf, marten, great gray owl • black huckleberry, white spruce, subalpine fir, soopolallie
Engelmann Spruce Zone is the highest forested zone in most of B.C., having long cold winters and cool short summers.	• lynx, mule deer, northern flying squirrel, red crossbill • glacier lily, Engelmann spruce
Boreal White and Black Spruce Zone is found in the northeast of the province, occurring from the Yukon to Newfoundland, with short growing seasons, very long winters, but light snowfall.	• mountain goat, grizzly bear, wood bison, black-throated green warbler • trembling aspen, white spruce, tamarack
Spruce-Willow-Birch Zone is the most northerly subalpine zone in the province, with long cold winters and brief cool summers.	• Stone sheep, spruce grouse, red squirrel, least weasel • pink mountain-heather, willow
Alpine Tundra Zone occurs on high mountains throughout the province, includes glaciers and snowfields, and has the harshest climate in B.C.—cold and snow most of the year, with only a short growing period.	• gyrfalcon, white-tailed ptarmigan, hoary marmot, arctic ground squirrel • arctic willow, scrub birch, arctic lupine, Sitka valerian

*Available for download from *www.for.gov.bc.ca/research/becweb/becinfo/bec-view.htm*

Appendix 4—British Columbia's Ecoprovinces

Ecoprovince	Some Plants & Animals
Northeast Pacific is the oceanic portion of British Columbia west of the Continental Slope.	• northern fur seal, sperm whale, laysan albatross, Pacific white-sided dolphin, northern fulmar, albacore, pink-footed shearwater, basking shark, ocean sunfish
Coast and Mountains includes the west side of the Coast Mountains and Vancouver Island, all of the Queen Charlotte Islands, and the adjacent Continental Shelf.	• Vancouver Island marmot, killer whale, bald eagle, red-throated loon, clouded salamander, eulachon, pacific halibut • western hemlock, twinflower, Pacific silverweed
Georgia Depression lies between the Vancouver Island Mountains and the southern Coast Mountains. It is a large basin containing the Strait of Georgia and Puget Sound.	• Roosevelt elk, Trowbridge's shrew, crested myna, barn owl, Townsend's mole, glaucous-winged gull, • Garry oak, Douglas-fir
Central Interior Ecoprovince lies to the east of the Coast Mountains between the Fraser Basin and the Thompson Plateau, and contains the Chilcotin and Cariboo Plains.	• moose, California bighorn sheep, sandhill crane, western jumping mouse, Dolly Varden trout, Barrow's goldeneye • Engelmann spruce, lodgepole pine, trembling aspen
Sub-Boreal Interior lies to the east of the Coast Mountains and to the west of the Interior Plains in the north-central part of British Columbia.	• grizzly bear, lynx, boreal owl, magnolia warbler, western toad, arctic grayling, slimy sculpin • black spruce, subalpine fir
Southern Interior Mountains lies east of the southern interior plateaus in the southeastern portion of the province including the Columbia Mountains, the Southern Rocky Mountain Trench, and the Rocky Mountains eastern flanks.	• mountain goat, elk, hoary marmot, painted turtle, osprey, black-billed cuckoo, northern leopard frog, white sturgeon • ponderosa pine, western larch
Southern Interior lies east of the crest of the Coast and Cascade ranges and west of the Columbia Mountains, including the Thompson Plateau, the eastern portion of the Cascade Ranges.	• white-throated swift, western rattlesnake, great basin spadefoot toad, northern squawfish great basin pocket mouse, spotted bat, burrowing owl • arrow-leafed balsamroot, bluebunch wheatgrass, whitebark pine, ponderosa pine
Boreal Plains lies east of the Rocky Mountains, south of the Fort Nelson Lowlands, extending eastward across northern Alberta, Saskatchewan, Manitoba and southern Northwest Territories.	• Gray wolf, black-backed shrew, upland sandpiper, Connecticut warbler, northern pike, pearl dace, striped chorus frog, • white spruce, balsam poplar, soopolallie
Taiga Plains lies to the east of the northern Rocky Mountains in the northeastern portion of British Columbia as a large lowland dissected by the Liard, Fort Nelson and Pettiot Rivers.	• black bear, northern red-backed vole, lesser yellowlegs, spruce grouse, western toad, lake whitefish • paper birch, tamarack
Northern Boreal Mountains lies east of the Boundary Ranges of the Coast Mountains, west of the Interior plains, and south of the Yukon Territory in the north-central portion of British Columbia.	• thinhorn sheep, wolverine, tundra vole, chinook salmon, gyrfalcon, rock ptarmigan, Bohemian waxwing, lake trout • fireweed, twinflower, black spruce

*adapted from Dennis A. Demarchi (1993), *An Introduction To The Ecoregions Of British Columbia*, Wildlife Branch, Ministry of Environment, Lands and Parks, Victoria, British Columbia. A brief on-line version of this document can be found, including maps, at the Ministry of Sustainable Resource Management website (*srmwww.gov.bc.ca/rib/wis/eco/bcecode.html*).